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Item 7 of the provisional agenda*

ECONOMIC COMMISSION FOR AFRICA

Twenty-second session of the Commission/ thirteenth meeting of the Conference of Ministers

Addis Ababa, Ethiopia
23 - 27 April 1987

Item 6 of the provisional agenda**

LC/NAIROBI

REPORT ON THE REGIONAL CONSULTATIVE MEETING ON THE MOBILIZATION OF FINANCIAL RESOURCES FOR THE DEVELOPMENT OF NEW AND RENEWABLE SOURCES OF ENERGY IN AFRICA

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* E/ECA/TPCW.8/1.

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I. Organization and attendance

Opening of the Regional Consultative Meeting (agenda item 1)

1. The Regional Consultative Meeting for the mobilization of financial resources for the development of new and renewable sources of energy in Africa was held in Addis Ababa, Ethiopia, from 25-27 November 1986.

2. The meeting was opened by Mr. M. Tchouta-Moussa, Deputy Executive Secretary of the Economic Commission for Africa.

3. The meeting was attended by the representatives of the following african member States: Angola, Burundi, Egypt, Ethiopia, Ghana, Kenya, Nigeria, Mozambique, Rwanda, Senegal, The Sudan, and Zimbabwe.

4. The representatives of Austria, Belgium, Brazil, Canada, China, (Peoples Republic of), Federal Republic of Germany, Finland, France, Italy, Norway, Sweden, United Kingdom, United States of America and the Union of Soviet Socialist Republics also attended the meeting.

5. The representatives of the following African regional and subregional organizations were also in attendance: African Development Bank (ADB), Communauté Economique de l'Afrique de l'Ouest (CEAO), Economic Community of West African States (ECOWAS), Preferential Trade Area (PTA), South African Development Co-Ordination Conference (SADCC), and Economic Community of the Central African States (ECCAS).

6. The meeting was also attended by the representatives of the following international organizations and organizations within the United Nations system: Office of the Director-General for Development and International Economic Co-operation (DIEC), Department of International Economic and Social Affairs (DIESA), Department of Technical Co-operation for Development (DTCD), Food and Agricultural Organization (FAO), International Labour Organisation (ILO), International Telecommunication Union (ITU), United Nations Development Programme (UNDP), United Nations Environment Programme (UNEP), United Nations Educational, Scientific and Cultural Organization (UNESCO), World Meteorological Organization (WMO), and European Economic Community (EEC).

Election of officers (agenda item 2)

7. After consultations among Heads of delegations the following bureau was unanimously elected: Chairman: Kenya, Vice-Chairman: Egypt and Rapporteur: Senegal.

II. Adoption of the agenda and organisation of work (agenda item 3)

8. The regional consultative meeting adopted the following agenda:

1. Opening of the Regional Consultative Meeting
2. Election of officers
3. Adoption of the agenda and organization of work
4. Consideration of the regional, subregional and national NRSE programmes in Africa
5. Consideration of proposed NRSE project profiles:
   (a) statements by country representatives
   (b) statements by members of the United Nations systems and African economic groupings
   (c) statements by donor countries and funding agencies
6. Consideration of arrangements for the implementation of the NRSE projects
7. Round-table consultations on proposed projects
8. Conclusions and recommendations
9. Adoption of the report of the meeting.

III. Account of proceedings

9. In his welcome address the Deputy Executive Secretary of ECA, Mr. M. Tchouta-Moussa conveyed regrets of Mr. Adebayo Adedeji, who was unable to attend the Regional Consultative Meeting because of other pressing commitments in the United Nations Headquarters.

10. He said that the regional consultative meeting for the African region was convened for the purpose of providing a forum for potential donors, African recipient countries and international organizations to consider the promotion of projects in the field of new and renewable sources of energy and to address the question of mobilization of financial resources for the implementation of these projects.

11. He highlighted the problems of overdependance on conventional sources of energy by African member States as well as the energy needs of Africa in view of economic crisis. He said that NRSE in Africa are expected to play a major role in alleviating some of the energy problems existing in African member States which have a significant potential and are in a particularly good position to develop and utilize them.

12. He stressed the importance of an effective energy transition for economic survival and social progress and indicated that in spite of the recent weakening of the oil prices the development of NRSE should be viewed as process that would make energy available to the remote rural African communities where it had been difficult so far to create an impact with the conventional sources of energy.

13. He also reiterated that for the most African countries non-commercial sector was the largest consumer of energy and hence the one with the most far reaching consequences from conservation point of view, since it is in this sector where bulk of wood and wood products are used, both in the rural and urban areas.

14. He also emphasized the point that since Nairobi Conference, NRSE have been advocated as a wide-spread solution to the energy problems of Africa. Unfortunately in some cases, the credibility of NRSE and renewable energy technologies has suffered from premature and excessive promotion of these technologies in Africa.

15. He expressed a hope that as a result of this Regional Consultative Meeting of donor countries, African member States and subregional organizations new avenues for international co-operation will be discovered and the concrete programmes for the mobilization of financial resources for the development of NRSE in Africa will be outlined.

16. He assured the participants of the meeting of the readiness of the ECA Secretariat to render full support to all the efforts aimed at the development of NRSE in Africa and wished every success in the forthcoming consultations.

17. In his address the Special Co-ordinator for NRSE in the Office of the Director-General for Development and International Economic Co-operation, conveyed to the meeting the best regards of the Director-General, Mr. Jean Ripert.

18. He expressed his thanks to the Governments of Italy and France for their financial contribution to the preparation of the consultative meeting. He discussed the situation with regard to energy prices and the difficulty experienced in energy planning, due to prices unpredictable fluctuations.

19. Then he also emphasized the role NRSE could play in the rural areas of Africa which are experiencing a fuelwood crisis and problems of technology application. He finally spoke of the importance of the projects submitted to the consultative meeting and of the opportunity given by this meeting to donors, recipients and international organizations, enabling them to exchange their views and opinions.

Consideration of the regional, subregional and national NRSE programme in Africa (agenda item 4)

20. A representative of the Secretariat briefly introduced the document ECA/NRD/RCM/4/86 on development of new and renewable sources of energy in Africa. He said that the document dealt with main aspects: the situation regarding development of NRSE in Africa and the project profiles submitted by member States, regional and subregional organizations. Under this agenda item he outlined on assessment of energy situation in Africa and the role of NRSE.

21. He stressed the point that energy problems remained serious in African countries despite the recent weakening in world energy prices. He also pointed out that doubts had been recently expressed regarding the importance and priority to be accorded to NRSE in light of the shift in the global oil situation with a consequent adverse impact on research and development of NRSE.

22. In the discussion that followed the member States developed and developing countries, intergovernmental organizations and United Nations agencies presented their statements on the development of NRSE in the respective countries and organizations.

Sudan

23. The research and development work in NRSE in Sudan is devoted to (a) Research and development of renewable energy technologies and (b) dissemination and promotion of renewable energy technologies. There are a number of pilot projects to determine social acceptibility and economic possibility to organize local production of applicances using renewable sources of energy. In the field of dissemination of technologies they are promoting the following:

1. improved charcoal stoves;
2. utilisation of agricultural residues as a new source of charcoal;
3. promoting biogas units for cooking and lights;
4. promoting integrated agro-forestry projects;
5. promoting PV utilization for various purposes;
6. promoting wind pumps for pumping ,round water for drinking and irrigation.

Ethiopia

24. Most of the present energy consumption in Ethiopia is based on NRSE. In 1984 about 95% of the energy consumed was based on biomass and hydro-power and the rest was based on imported oil. About 65% of the installed electricity generating capacity and 75% of the electric energy generation was based on hydro-power. Hence it is clear that NRSE play a determinant role in the development of the country. However, this pattern of consumption together with the wasteful utilization of biomass has caused deforestation and wide scale environmental degradation. For the above reasons the government has given priority

to the rationalization of the energy consumption and more efficient utilization of the existing sources and to the development of more advanced forms of energy from NRSE so as to supply energy for the subsistance and development needs of the broad masses of the country, to enhance self sufficiency and to save foreign currency. Consequently a number of programmes have been implemented or are being implemented in order to fulfill the above objectives:-

- a comprehensive energy survey has just been completed which will help to formulate short and long term energy policies and programmes and to dtermine the role of the various energy sources and forms to satisfy the energy demand of the country.

- A number of projects are being implemented both to increase the biomass resource base and to improve efficiency of utilization like large scale and community energy plantations with suitable species, improvement of biomass conversion technologies and utilization in charcoaling, briquetting of agricultural wastes, biogas, producer gas, introduction of more efficient stoves.

- In the solar energy development:- installation of a 10.5 KW PV power plant to supply lighting to about 400 houses, street lighting schools and clinics as well as refrigeration of medicines in a farmers cooperative, this is now being expanded to 30 KW to supply an additional water pump, flour mill and a small workshop.

- Installation of about 22 KW PV capacity for irrigation and water pumping in various parts of the country.

- Installation of a 100 m^2 solar water heating to supply the hot water needs of about 300 students.

- Preparation of solar energy parameter correlation factors and completion of a solar energy Atlas for the whole of the country.

In the Hydro Power Development:-

- Continuation of the development of big Hydro Power Plants like the Melka Wakana (150 MW) and the Gelgel Gibae (300 MW) for centralized power production and the development of a number of mini hydro power plants (about 10 MW) for decentralized electricity supply systems.

- Preliminary assessment of the Hydro Energy Potential of the country.

In Geothermal Development:-

- Undertaking of a comprehensive Survey for the assessment of the geothermal potential of the country, drilling of 9 wells in the Langano geothermal field with 7 producing wells, continuation of drilling in other favorable areas, undertaking of a feasibility study for the construction of geothermal power plant.

In the Wind Energy Development:- development of suitable wind pump designs for water supply and irrigation, determination of the wind potential and preparation of a wind Atlas, and wind data correlation factors for the whole country.

Zimbabwe

25. There are a number of projects in NRSE in Zimbabwe falling under the subjects of solar, biomass and research and development. Solar energy is used for water heating and crop drying and there is a project to supply electricity to some rural institutions such as clinics and hospitals with PV systems. In the area of woodfuel utilization there are two projects aimed at the development of an efficient woodstove and the introduction of biodigestors for household use. In order to fully implement the projects mentioned above, plans to establish an Energy Research Institute has been formulated that in principle have been accepted by the Government.

Egypt

26. Bioenergy constitutes a prominent component in the New and Renewable R & D Egypt's Programs. Much attention has been given to biogas technology within the R & D strategy supported by the Egyptian Academy of Scientific Research and Technology where much of multidisciplinary work was accomplished. Field demonstration were conducted in various villages and at various scales. These provided a rational base for assessing the techno-economic aspects of the biogas technology and its prospective social acceptability.

27 More recently, work has been directed toward developing improved rural biomass stoves and ovens as well as portable gasifiers. High efficiency, non-polluting, agricultural residue-burning stoves have been developed and will be field-demonstrated in the near future. Energy from biomass appears to have good prospects, particularly in rural areas of Egypt. Several constraints have to be relaxed before the full potentiality of bioenergy can be reaped.

Senegal

28. The representative of Senegal emphasized the importance of NRSE for the agricultural sector, reflecting OAU opinion. Then he said that the success of any project depends strongly on a good appreciation of the socio-economic and cultural aspect. He asked the countries and organizations to bring more details about their projects, in order to facilitate the negotiations with donors, in close collaboration with ECA.

Ghana

29. Ghana is well endowed with NRSE especially biomass, solar and mini-hydro power. A significant amount of local research in renewable energy technologies has already been done. The government of Ghana is interested in the exploitation of NRSE to meet strategic energy demand especially of the rural population. It has therefore established the requisite institutional and financial framework to promote the development of these important energy sources. To meet the policy objectives of the government in the short term period, 1986-1988, a consolidated work programme for renewable energy development has been formulated.

Burundi

30. The representative of Burundi presented some aspects of the development of NRSE in his country, especially dealing with fuelwood, biogas and gasification, solar energy, microhydro and wind energy. He informed the meeting of some aspects of the NRSE research in Burundi, and commented on the various contributions of donor countries and agencies, and outlined how Burundi is involved in the implementation at subregional projects which include Zaire, Burundi and Rwanda.

Kenya

31. The development and application of NRSE basically fall under the umbrella of the Ministry of Energy and Regional Development. The Ministry is quite active in coordinating energy Research and Development, especially with regard to rural population. The NRSE development and application which are currently being implemented actively are, inter alia, hydro-electrification, afforestation and geothermal power generation. Kenya is in fact in the forefront in the exploitation of geothermal energy among the countries which fall within the Rift Valley Zone. There is already a viable geothermal power station in the Republic which is contributing to the national electricity supply while other wells are in the process of being exploited. Apart from the commendable government efforts towards the development and utilization of NRSE, there are other organizations such as the public universities, non-governmental organizations and private firms, which are actively engaged in the development of NRSE.

Nigeria

32. Nigeria regards the development of the rural sector of the nation as a high priority. In view of this, harnessing NRSE, particularly solar Energy, for the improvement of the living conditions of the rural population is rated as a high priority programme within the programmes being considered in the fifth national plan by the relevant government organ namely, the Ministry of Science and Technology. Currently, there are on-going projects at the nations' two

solar energy centres as well as institutions of higher learning in the general areas of design and fabrication of efficient stoves, small scale biomass and biogas plants and solar energy devices, all targeted at improving living conditions in the rural sector in accordance with set government objectives.

ADB

33. The Bank Group with the help of USAID and NRCEA had organized two meetings on mini-hydropower. For the energy sector the Bank developed the policy according to which ADB group will play an important role in realizing the long-term objectives of LPA for energy at both national and regional levels. Its area of interventions are of three types: energy production projects, energy use in projects and supporting activities. ADB recently had intervened largely in the development of NRSE and especially hydropower. However, for the projects costing less than US$3 million, it is recommended that they should be financed by subregional and national banks.

OAU

34. In the implementation of the Lagos Plan of Action considerable success has been recorded in the realm of NRSE, the technologies of which can be appropriate for the need of the people in the rural and remote areas of Africa. Renewable energy technologies that are feasible for developing world will still need to be further adapted for the specific locations and this is the task for which local technological research capabilities will be required.

ECOWAS

35. Evidence from ECOWAS Energy Reports show an appreciation of ECOWAS Energy crisis. The cause of the crisis is not from energy under-endowment. The problem is linked to the irregularities in the distribution of primary energy resources, shortages of capital in industrial countries, technologically underdeveloppped and poor managerial ability, inadequate infrastructure and lack of information. In the face of these problem ECOWAS needs have continued to expand. The Community solution strategy are: (a) petroleum development and (b) alternative source of energy. Regarding NRSE attempts have been made to advise on the role that these sources of energy can play in the effort to meet the energy needs. The programme have the support of the Heads of State. In all of the NRSE, the basic strategy of implementing of the programmes is the setting up of technological core groups within various sectors.

ECCAS

36. Since its establishment on 18 October 1985 in Libreville, ECCAS has attached a great importance to energy issues in the subregion. A recent ECA

report states that Africa energy reserves amount to 55 billion barrels of oil; 5,9 billions tonnes of coal; 1,7 million of uranium and 200,000 MW hydropower and NRSE are also very large in the continent. Because of the underdevelopment of its technical capabilities, Africa lags behind other continents in promoting its own energy sources. Much of oil produced in the subregion is exported and there is a strong need to develop NRSE and in particular hydropower. For that purpose, ECCAS envisages to elaborate a master plan for energy development, putting emphasis on all energy resources including the identification and the evaluation of NRSE in the subregion.

France

37. La délégation française se félicite des présentation et débats tenus lors de la présente conférence. Les interventions montrent combien l'approche programme a progressé dans l'élaboration des actions dans le domaine des Energies Renouvelables. Certains projets paraissent remarquablement formulés notament dans le domaine du bois de feu, d'autres resent à approfondir, mais d'une manière générale la tendance est à une prise de conscience croissante de la nécéssité d'intégrer lesprojets SENR dans les priorités nationales de développement. En confirmation de cette tendance, la délégation française propose les recommendations suivantes.

- intégrer les actions énergies renouvelables dans les programmes sectoriels prioritaires nationaux;

- associer dans la conception et la mise en oeuvre des acgions SENR les responsables et techniciens du secteur utilisateur;

- concevoir les actions SENR en terme de programmes et non de projets isolés: les présenter si possible par étapes successions, du projets de démonstration à la réalisation d'un programme de plusieurs ou de plusieurs dizaines d'équipements;

- promouvoir la réalisation de programmes géographiquement regroupés, pour permettre de résoudre les problèmes de maintenance;

- favoriser une coordination des initiatives au niveau sous-régional et plus généralement accroître l'échange d'information entre les différents Etats et les différentes sous-régions.

Italy

38. The department of alternative energy of ENEA aims at the development of the products and processes which may have production and consumer potential. At present it is dealing with solar technology, biomass conversion and wind energy utilization for water pumping. In co-operation with other governmental bodies ENEA implements the following programmes in the field of energy:

- enhancing the development of technical and scientific capabilities;

- awarding fellowships and organizing training courses for technicians and researchers. There are some projects in Africa executed by ENEA dealing with various aspects of utilization of NRSE in Kenya, Morocco, Senegal, Somalia, Egypt and Cape Verde.

Canada (IDRC)

39. The International Development Research Centre (IDRC) provides support for developing country scientists and institutions to carry out research on problems that they determine to be important within their own national context. IDRC has traditionally regarded energy as part of a number of systems and not as a distinct discipline. It has not, therefore, created an energy division, but supports energy research through several of its programmes, as follows:

- Forestry Programmes e.g. afforestation, improved stoves;
- Energy Policy: e.g. assessments of technologies, surveys, planning;
- Post-Production Systems: e.g. crop drying, energy from agricultural wastes;
- Water Supply and Sanitation: e.g. wind pumping, desalination, solar disinfection;
- Information: establishment of energy-related information systems;
- Co-operative Programme: collaborative research between developing and developed country researchers.

Stratégie énergie environnement développement (SEED), France

40. As a part of its preparation for this meeting the ECA secretariat organized round trip in Europe and North America to some of the main donor agencies in order to discuss their present policy directions and to identify the type of programme and projects more likely to attract their interest and to be funded in the short term. It appeared necessary to meet these donors and assess their present position and understand their approach to the project proposals which needed their financial support. In the process of consultations with donors it was established that the NRSE message is not reaching the decision-makers, grant or loan offices in the very sectors which would appear to be the "natural markets" for these new technologies: irrigated agriculture, village water supply, wood or agro-industries, rural health, education etc., that is all sector where NRSE can have a positive impact on the programmes, reducing the risks and the operating costs. The ECA secretariat representing the

African member States faces the challenge to interest the donor agencies in the project proposals submitted to this meeting at various levels in order to persuade them that NRSE can bring appropriate solutions to the needs of rural community in Africa.

FAO

41. FAO works in the areas of energy assessment and planning, technological development and information exchange oriented to promote rural and agriculture development. The largest FAO energy programme is in the field of fuelwood, and is related to forestry, agroforestry, industrial wood energy, charcoal, improved stoves and wood surveys. Other areas of work are in the field of biogas, solar, wind and draught animal power. In general, our programmes are geared to the promotion of these sources and their related technologies under the framework of national policies and strategies. A variety of modes, were utilized for the energy work in assisting developing countries. There is no doubt that energy planning and policy making are national responsibilities and therefore our work in this area is of assistance on developing methodologies, assessments, exchanging experiences and institutional strengthening. In relation to technological development, our agency concentrates its efforts on country projects and in the promotion of inter country networks. Examples in this area are the solar, wind and biomass networks in Latin America, the biogas, gasification and solar drying networks in the Asia and Pacific region and the present work to establish a biogas and a solar drying network in Africa. These networks promote R & D, pilot studies and are the core for training and personnel exchange activities. Interregional co-operation is promoted in the fields of rice-husk gasification, biogas, ethanol production, utilization of agriculture residues and solar and wind energies.

ILO

42. The activities of ILO in NRSE covered the following areas: (a) manpower and training assessment in the energy sector; (b) implementation of concrete training programmes, related to energy; (c) assessments of the social and economic implementations of energy policies and programmes; (d) extension of energy-related activities such as the development of afforestation programme; (e) study of the labour and social issues pertaining to such energy sectors as forestry and wood industries for example, ILO also has undertaken a study on the use of more labour intensive techniques in the construction of small hydro power projects in Tanzania and the introduction of improved efficient fueldwood use in tile and pottery kilns in Rwanda.

UNEP

43. UNEP activities in the production of NRSE in Africa are not aimed at increasing the production of energy from NRSE per se, but rather promoting the reliance on NRSE for various activities, so that these will have lower and more

manageable impacts on the environment. These include the development evaluation and dissemination of improved cookers and ovens, woodfuel plantations as well as the promotion of wind, biogas, biomass wastes and PV techniques. Apart from its promotional work in the field of NRSE, UNEP is also involved in the evaluation of the environmental impactsof the production and use of all energy systems, including NRSE.

DTCD

44. Within the ECA region, DTCD is executing major projects in the development of geothermal energy in Kenya and Djibouti, in photo-voltaic energy in Egypt where a major PV powered reverse osmosis desalination prototype has recently become operational on the Red Sea Coast. At the same site a large wind powered ice maker in a fishing village is being installed. In Mauritius, after a detailed wind site analysis, a 100 kw grid connected demonstration machine is now being installed, while a smaller 2 KW village windpower unit has been in operation for the last two years on the island of Rodrigues. In Seychelles the Department has a project in solar, wind, and in biomass gasification using coconut husks. There are small projects primarily in solar PV and in wind pumping in Cape Verde, in the Gambia and in the Sudan. Finally DTCD has, over the last seven years, undertaken reconnaissance surveys of mini-hydropower in 25 countries in the ECA region with bilateral funding. In Ethiopia this has already led to a major demonstration project. The Department is now proposing a follow-up regional project for detailed feasibility investigation and design of selected small hydropower sites in six countries, including the preparation of specification for the construction of the respective schemes.

UNESCO

45. UNESCO launched in 1981 the world's energy information system regarding NRSE which is conducted in association within its general information programme. UNESCO also is supporting information network in energy planning in Africa aimed at manpower training. One of the major programme activities of UNESCO on energy, NRSE included, is the establishment of regional projects for enhancing existing information services and encouraging the sharing of information resources in an effort to link organisations with an international network. In Africa two subregional pilot projects on NRSE information sharing networks were already established one in Eastern and Southern Africa and the second one for West Africa.

Consideration of proposed NRSE Projects Profiles (Agenda item 5)

46. On considering this item of the agenda, the meeting agreed that project profiles should be presented in groups based on themes on energy sources at national, subregional and regional levels. The projects were presented under the following themes: Solar, wind, hydropower, biomass (including charcoal and fuel-wood), biogas, energy conservation, information, socio-cultural and general. Projects under each theme were presented and discussed by both the recipient and donor countries.

47. The following countries/organizations presented their projects: Angola, Ethiopia, Egypt, Burundi, Ghana, Kenya, Senegal, Sudan, Zimbabwe, Nigeria, ECA ECOWAS, CEAO (CRES), SADCC, CEPGL, UNSO, ILO, UNC and DTCD. During the presentation it was pointed out that the projects presented were authentic projects which had been designated by respective governments as priority projects in the field of development of NRSE.

48. It was further pointed out that in situations dealing with rural development it was not always easy to designate a project, the label of "highest priority" due to the relatively small size of such projects compared to the large industrial projects designed to supply energy to urban areas. Some delegations affirmed that the projects presented were invorporated in the current development plans of their countries. The projects presented also indicated that the ultimate objectives of the projects was to link them with development activities such as agricultural production, education, telecommunication and health programmes.

Project profiles presented:

Regional project profiles

ECA (4 projects)

49. Project No. 1

1. Establishment of an African Regional Centre for Solar Energy

2. - To disseminate results of solar energy studies,
   - To promote multinational co-operation,
   - Research-development

3. ECA and the Governments-member of ARCSE

4. 5 years

5. 10 millions US$.

50. Project No. 2

1. Establishment of an East African Geothermal Institute

2. - Collect and disseminate information,
   - Ensure project co-ordination and co-operation,
   - Carry out research and development on the exploration and development of geothermal resources.

3. ECA and the Governments of East-African countries

4. 21 months

5. 430,000 US$ (Study, first phase).

51. Project No. 3

1. Seminar and Study Tour on Small Scale Hydropower Schemes and Biomass (in India)

2. - Assessing technical and economical performances of these schemes, analysing the possibility to transfer the technology and adapt it to africain conditions.

3. ECA

4. 2 years

5. 362,000 US$.

52. Project No. 4

1. Integration of Existing African Data on NRSE into PADIS

2. - To establish an information system on energy and to connect this system with the existing international information network

3. ECA-UNESCO

4. 3 years

5. 2,128 million US$.

Subregional Project Profiles

SADCC (6 projects)

53. Project No. 1

1. Renewable Energies Development (Lesotho)

2. - Dissemination of the biodigesters already developed
   - Further testing of simple solar energy devices
   - Testing and implementation of small windmills
   - Energy conservation measures

3. Government of Lesotho and SADCC
4. 749,000 US$

54. Project No. 2

1. Investigation into Local Customs and Potential Acceptability of New Technology in Rural Communities (Swaziland)

2. - Generate detailed sociological data about typical rural communities where new energy should be introduced
   - Provide market information

3. Government of Swaziland and SADCC
4. 90,000 US$

55. Project No. 3

1. Harnessing the Seasonal Flow Rate of the Curvea, Giraul, Bero and Bentiera Rivers to reforest the Riverbanks for Energy Purposes (Angola)

2. - To evaluate techniques of irrigation for reforestation in arid and semi-arid regions
   - Evaluate the effects of small dams
   - Restore the energy basis for rural populations in Namibie province
   - Disseminate results in other SADCC countries

3. SADCC and Angolan Government
4. 650,000 US$

56. Project No. 4

1. Wood/Charcoal Stoves Development and Dissemination Project (Lesotho)

2. - Promotion of energy conservation

- Establishment of small-scale industries for the production of improved stoves
- Dissemination of the results of the programme in other SADCC countries

3. SADCC and Government of Lesotho
4. 129,000 US$

57. Project No. 5

1. Reafforestation in the Eastern Part of Swaziland and Southern Mozambique

2. - Establish a secure source of firewood and building poles
   - Improve agricultural production

3. SADCC and Governments of Swaziland and Mozambique
4. 540,000 US$

58. Project No. 6

1. Establishing a Fuelwood Plantation at Ruvu (Tanzania)

2. - Improve the supply of woodfuel

3. Government of Tanzania and SADCC
4. 470,000$

CEAO - CRES (1 project)

59. Project No. 1

1. Programme Regional d'Equipement en Energies Renouvelables sur la Base de Programmes Nationaux de 9 Etats

2. Mise en oeuvre : 9000 équipements à installer, pour :

   - l'hydraulique villageoise
   - l'éducation et la culture
   - la santé rurale
   - les télécommunications
   - les transports
   - la lutte contre la déforestation
   - et l'assistance technique permanente)

3. Agences gouvernementales
4. 5 ans
5. 62 milliards de F CFA

ECOWAS (11 projects)

60. Project No.1

1. ECOWAS Alternate Energy Sources Programme

2. - To develop potential uses of NRSE

3. Governments
4. 100,000 US$

61. Project No. 2

1. Small and Medium Hydropower for ECOWAS Countries

2. - Provide a continuous source of electric power
   - Establishment of engineering and manufacturing industries

3. Governments
4. 400,000 US$

62. Project No. 3

1. Long Term and "Survival" Energy Projects in the Community

2. - Study of the promotion of all types of NRSE in ECOWAS states

3. ECOWAS Secretariat
4. 10,000 US$

63. Project No. 4

1. Identify and Draw up Plan for the Implementation of "Survival" Energy Projects in ECOWAS

2. - Studies about Energy Sector as a whole

3. ECOWAS Secretariat
4. 10,000 US$

64. Project No. 5

1. Infrastructure for Photovoltaic Solar Energy System

2. - To facilitate the development of an infrastructure to supply spare parts, provide engineering and installation services

3. ECOWAS Secretariat
4. 30,000 US$

65. Project No. 6

1. Alcohol Fuel Production from Agricultural Wastes

2. - Formation of an Alcohol Technology Core Group

3. ECOWAS Secretariat
4. 10,000 US$

66. Project No. 7

1. Integrated Agricultural Systems

2. - Formation of an Agricultural Technology Core Group
   - Installation of systems

3. ECOWAS Secretariat and Governments
4. 400,000 US$

67. Project No. 8

1. Improved Wood and Charcoal Stoves and Fuel Wood Plantations

2. - Develop more efficient wood and charcoal stoves
   - Planting of wood for fuel production

3. Governments
4. 50,000 US$

68. Project No. 9

1. Study of the Energy Problems and Needs of the Rural Areas in ECOWAS and Making Concrete Proposals in Meeting these Needs

2. - Identify the energy problems and needs of rural areas in order to find solutions

3. ECOWAS Secretariat
4. 60,000 US$

69. Project No. 10

1. Study of the Faisability of Establishing Small Scale Industries of Improved Cooking Appliances

2. Energy conservation

3. ECOWAS Secretariat
4. 60,000 US$

70. Project No. 11

1. ECOWAS Solar Energy Villages

2. - Demonstration and pilot project to prove the faisability

3. ECOWAS Secretariat
4. 300,000 US$

COI (Commission de l'Océan Indien)

71. Project No. 1

Programme sous-régional (Madagascar, Réunion, Comores, Maurice, Seychelles)

Refer to EEC documents

WMO - OMM (1 projet)

72. Project No. 1

1. Analyse des Ressources Eoliennes

2. - Meilleure connaissance des conditions climatiques
   - Préparation d'un atlas de la ressource énergétique éolienne
   - Elaboration des données nécessaires à la lutte contre la désertification et au développement de l'agriculture

3. OMM et Gouvernements de l'Algérie, du Maroc et de la Tunisie
4. 3 ans
5. 120,000 US$

National Project Profiles

ZAMBIA (9 projects)

73. Project No. 1

1. Peri-Urban Electrification Project Study

2. - Determine the cost of electric supply

3. Government
4. 50,000 US$

74. Project No. 2

1. The Woodfuel Project Studies

2. - Land management and conservation
   - To promote agroforestation programme

3. Government
4. 50,000 US$

75. Project No. 3

1. Dissemination for Commercialisation of Efficient Charcoal Stoves

2. - Manufacture of improved charcoal stoves
   - Monitoring of their introduction into rural areas

3. Government
4. 200,000 US$

76. Project No. 4

1. Study of the Diffusion of Improved Kilns

2. - Determination of the social economic factors of dissemination

3. Government
4. 10,000 US$

77. Project No. 5

1. Demonstration of Biogas Generation Technology

2. - Determine the investment need
   - Construction and demonstration of four biodigesters

3. Government
4. 50,000 US$

78. Project No. 6

1. The Woodfuel Survey

2. - Follow-up of the FAO study
   - Study of future supply/demand of woodfuel and wood for industrial purposes

3. Government
4. 50,000 US$

79. Project No. 7

1. Windmill Demonstration Project

2. - Design, manufacture and install five prototype windmills for pumping water
   - Monitoring and identify a local manufacturer for the mass production

3. Government
4. 50,000 US$

80. Project No. 8

1. Solar Water Pumping Project

2. - Demonstrate and monitor the performance of solar pumping

3. Government
4. 100,000 US$

81. Project No. 9

1. Development of Micro-Hydro Systems

2. - Identification of sites
   - Development and monitoring of the developed micro-hydro systems

3. Government
4. 100,000 US$

CAMEROON (3 projects)

82. Project No. 1

1. Mini-Hydropower Project at the villages of Banyo and Kodadouma

2. 300,000 US$

83. Project No. 2

1. Improvement of Fuel Stoves and Biogas Production

84. Project No. 3

1. Utilisation of Solar Energy - Improvement of Solar Water-Heaters for Households and Hotels

ANGOLA (3 projects)

85. Project No. 1

1. Etude d'Implantation d'une Unité de Fabrication de Pompes Eoliennes

2. - Fournir l'eau aux population villageoises

3. Gouvernement angolais
4. 86,400 US$

86. Project No. 2

1. Installation d'un Laboratoire d'Etude de Conversion du Rayonnement Solaire en Energie Electrique et Thermique à des Fins Scientifiques et Didactiques

2. - Applications technologiques

3. Gouvernement angolais
4. 6 mois
5. 18,750 US$

87. Project No. 3

1. Etude de Panneaux Solaires Photovoltaïques

2. - Acquérir le savoir-faire, concevoir, dimensionner et installer des générateurs PV

3. Gouvernement angolais
4. 2 mois
5. 20,400US$

ZIMBABWE (6 projects)

88. Project No. 1

1. Solar Water Heaters

2. - Establish a marketing and distributing centre

3. Government, private sector, rural councils

89. Project No. 2

1. Photovoltaic Generation

2. - Provision of PV systems for 26 rural centres

3. Z$ 60,000 each, total : 1,560,000 Z$

90. Project No. 3

1. Fuel Efficient Woodstoves

2. - Familiarizing rural people with a new and beneficial kind of technology
   - Satisfy national goals to conserve wood and preserve the environment

3. Department of energy, local authorities

91. Project No. 4

1. Rural Afforestation

2. - Solve the problems of afforestation

3. Government and communities

92. Project No. 5

1. Dissemination of Biogas Technology

2. - Ensure local production of gas burners, gas lamps and cookers for rural communities

3. Government

93. Project No. 6

1. Establishment of an Energy Research Institute

2. - To consolidate present efforts and look into research to reduce the cost of energy systems

3. Government

MADAGASCAR (1 project)

94. Project No. 1

1. Project "Energy one" (initié par la Banque Mondiale)

2. - Réabilitation du sous-secteur de la production de l'électricité
- Améliorer la capacité de planification énergétique
- Mieux exploiter la biomasse

3. Société de l'Electricité et de l'Eau de Madagascar (JIRAMA)
4. Coût total : 69,6 millions de US$ dont :

25	IDA
19,3	Etat malgache
25,3	A rechercher

(ont été déjà approchés : CCCE, FED)

NIGERIA (3 projects)

95. Project No. 1

1. Efficient Woodstoves

2. - Conserve scare forest resources

3. National solar energy research centres, rural communities

96. Project No. 2

1. Solar Cookers

2. - Reduce the use of fuelwood

3. National energy centres

97. Project No. 3

1. Biogas/Biomass

2. - Alternative to fuel wood in domestic cooking

3. Solar energy centres, polytechnics

Subregional Project (ESCAP)

98. Project No. 1

1. Subregional TCDC/ECDC in new and renewable sources of energy (NRSE)

2. To transfer technology and experience between regions in NRSE fields that have been demonstrated as having immediate prospects of providing economic energy supplies, by using existing programmes and facilities in the various regions to benefit other region at minimum cost.

3. ESCAP, ECA and member States of the regions

4. 2 years

5. 157,000 US$

PEOPLE'S REPUBLIC OF ANGOLA (5 projects)

99. Project No. 1

Title : Purchase of ten (10) Aero-Pumps for the Provinces of Namibie and Huila

Objectives: - Assembly of ten (10) Aero-Pumps in Namibie and Huila in order to test their performance, and to gather data needed for the technico-economical feasibility study for the installation of the factory.

- Water supply to the rural population.

- Analysis of the acceptance and integration degree by the populations regarding this equipment.

Terms of reference: Due to the characteristics of the forages and the velocity of wind in Namibie, the Aero-pumps must be:

- evaluation power between 25 and 40 mts,
- equiped with towels, and pumps and accessories.

The Assembly will be followed by two (2) angolan experts, to absorbe the knowledge of the Assembly of the equipment.

Estimated cost: 40,000 US$

100. Project No. 2

Title: Study for the implementation of a factory of Aero-pumps

Final objective: Supply the country population, by means of a correct utilization of underground water of the Southern areas of the country.

- Contribute to the reduction of the shortages in field of water supply and increase livestock and foodstuffs production.

Immediate Objectives: Perform the technical and economical feasibility study of the assembly of a factory for construction and assembly of aero-pumps.

Estimated costs: 85,000 US$ (does not include the Angolan Government contribution)

Solar Energy

101. Project No. 3

Title: Installation of a Laboratory for:

- Study of conversion of solar radiation into electric and thermic energy with scientific and didactic purpose

- Study of Photovoltaic panels

Objective: - Purchase of gathering material and analysis of data which would permit the study of the technologic application of thermic conversion and of conversion into electric energy and others;

- Investigation and development in the field of synthetic materials for conversion and storage of energy;

- Accurate determination of the production capacity and of the conditions that this (production) is furnished by the photovoltaic generators in the local radiation climate;

- Creation of local know-how in order to make possible an active inter-action in the choice of the equipment in the project and in the usage/maintenance of the photovoltaic generation systems.

Estimated costs: 36,000 US$

102. Project No. 4

Title: Reforestation of Orca-Zanga area

Objective: - Stop the destruction of the natural productive forest

- Begin the recovery of the areas without trees in order to re-establish and subsequent increase their former productive potential;

- Reforestation of deforested areas with trees from the region itself aiming at creating the possibilities of increasing the production of wood for energy purposes;

- Plantation of forests of exotic trees for energy purposes and to product poles;

- Create jobs for the surrounding populations.

Anticipated results: Evaluate the needs for firewood of Luanda City and traditional areas

- Select traditional trees of the region
- Reforest 200 hectares with quick growing trees
- Establish cooperative societies for charcoal production.

Estimated costs: 400,000 US$

103. Project No. 5

Title: Assembly of Micro-Turbine

Objective: - Hydro-electricity generation at low cost as a replacement of electricity generation by means of oil products;

- Supply of electrical power to small population;

- Possibility of installation of small hydro-electricity power stations associated to social programmes at provincial and municipal levels.

Phases: 1st phase: Identification, Technical and Economic Study

2nd phase: Installation of (2) Micro Turbine in Cabinda and Namibie Provinces

Cost: Not estimated

CEPGL (14 projects)

104. Project No. 1

Titre du projet: Etude de faisabilité pour les aménagements des micro-centrales hydro-lectriques de RUMOBO et de KIBUYE en République du Burundi

Objectifs: Le projet consiste à:

- fournir l'énergie électrique en milieu rural;
- favoriser l'artisanat et la petite industrie à l'intérieur du pays;
- favoriser le regroupement en village suite à la fourniture de l'énergie électrique;
- augmenter l'emploi en milieu rural;
- freiner l'exode vers les centres surpeuplées.

Coût: 1 000 000 $EU

Durée 24 mois

105. Projet No. 2

Titre du projet : Etude de faisabilité pour les aménagements des mini-centrales hydroélectrique et construction des ouvrages pilotes à l'Est du Zaïre (KIVU)

Objectifs: - Identifier les sites les plus prometteurs;
- Inventoriser des projets spécifiques dans les sites sélectionnés;
- Formuler des études de faisabilité pour les projets spécifiques;
- Construction de la centrale.

Coût: 6 000 000 $EU

Durée: 24 mois, avec possibilité d'extention.

106. Projet No. 3

Titre du projet : Etude de faisabilité pour les aménagements des mini-centrales hydroélectriques et constructions des ouvrages pilotes du Rwanda

Objectifs: - Identifier les sites les plus prometteurs;
- Iventorier des projets spécifiques dans les sites sélectionnés;
- Formuler des études de faisabilité pour les projets spécifiques.

Coût: 6 000 000 $EU

Durée: 24 mois avec possibilité d'extention.

107. Projet No. 4

Titre du projet: Etude de faisabilité pour la fabrication des équipements des centrales hydroélectriques de faible puissane et autres utilisant du biogaz

Objectifs: L'objectif du projet est de promouvoir la coordination de la rationalisation du développement de l'industrie électrique de réduire progressivement les importations de matériel et/ou d'équipement électriques, ceux utilisant du biogaz également et de ce fait, réduire le déficit de la balance des paiements des pays de la sous-région.

Coût: 615 000 $EU

Durée: 24 mois, avec possibilité d'extension

108. Projet No. 5

Titre du projet: Coopération technique et transfert de technologies pour les équipements hydroélectriques de faible puissance et autres utilisant du biogaz

Objectifs:
- Assistance technique dans la préparation des guides concernant les plans types, standardisation et la fabrication des équipements des centrales hydroélectriques de faible puissance (turbines régulateurs et autres accessoires);
- Diffusion des informations et autres activités entreprises dans le domaine des centrales hydroélectriques de faible puissance et du biogaz.

Coût: 2 000 000 $EU

Durée: 24 mois, avec possibilité d'extension.

109. **Projet No. 6**

Titre du projet: Formation dans le domaine des centrales hydroélectriques de faible puissance et du biogaz

Objectifs: L'objectif principal est de former du personnel pour le développement du biogaz et des centrales hydroélectriques de faible puissance notamment pour évaluer les ressources de la demande, préparation des projets, jusqu'aux études d'exécution, sélection des équipements et les applications des technologies appropriées.

Coût: 400 000 $EU

Durée: 24 mois avec possibilité d'extension.

110. **Projet No. 7**

Titre du projet: Inventaire et évaluation du potentiel géothermique dans la sous-région de la CEPGL

Objectifs:
- Faire des études scientifiques nécessaires pour fournir l'évaluation du potentiel géothermique à partir des sondages à effectuer et des indicateurs techniques contenus dans les études déjà effectués dans la sous-région;
- Développer une méthodologie adaptable aux conditions particulières existantes dans les pays de la CEPGL;
- Mise à jour des informations déjà disponibles pour le potentiel géothermique dans la sous-région et identifier les champs géothermiques les plus intéressant;
- Inclure les données sur le potentiel géothermique dans le système de planification énergétique dans chaque pays de la Communauté de la CEPGL.

Coût: 1 115 000 $EU

Durée: 24 mois avec possibilité d'extension.

111. **Projet No. 8**

Titre du projet: Inventaire du potentiel bioénergétique dans la Communauté Economique des Pays des Grands Lacs (BURUNDI - RWANDA - ZAIRE)

Objectifs:
- Etre familiarié avec le potentiel bioénergétique dans l'élaboration des projets tant au niveau national que sous-régional;

- Mettre à jour le potentiel bioénergétique au niveau national et sous-régional
- Fournir un appui logistique quant à l'élaboration des études de préfaisabilité pour monter les programmes bioénergétiques dans chaque pays de la sous-région (RWANDA - BURUNDI - ZAIRE).

Coût: 750 000 $EU

Durée: 24 mois

112. Projet No. 9

Titre du projet: Biogaz et valorisation des déchets dans la sous-région de la CEPGL (Rwanda - Burundi - Zaïre)

Objectifs:
- Assister les pays de la sous-région dans les programmes à long terme en ce qui concerne l'utilisation des résidus de récoltes comme source d'énergie;
- Encourager l'utilisation des déchets végétaux comme source d'énergie par les transformations bioénergétiques;
- Promouvoir l'autosuffisance énergétique dans les secteurs qui produisent les déchets organiques.

Coût: 750 000$EU

Durée: 24 mois avec possibilité d'extension.

113. Projet No. 10

Titre du projet: Etude sur les extraits de plantes à latex comme source de carburant au Rwanda

Objectif: L'objectif visé est de rechercher les conditions optimales pour la production des molécules que l'on trouve dans les carburants classiques et d'en estimer le rendement

Coût: 20 000 $EU

Durée: 24 mois.

114. Projet No. 11

Titre du projet: Introduction des foyers améliorés transportables

Objectifs:
- Proursuivre les recherches sur la conception et la mise au point des cuisinières améliorées transportables à l'aide de matériaux locaux, utilisant comme combustible le charbon de bois;
- Introduire à petite échelle ces modèles pour en estimer l'accentabilité;
- Systématiser les méthodes de tests des cuisinières et une collecte facile d'information parmi les institutions ou les personnes s'occupant de la mise au point de foyers améliorés;
- Former des artisans sur la construction des foyers améliorés.

Coût: 50 000 $EU

Durée: 24 mois

Zone géographique: Villes de Kigali et de Butare en

115. Projet No. 12

Titre du projet: Application de l'énergie solaire dans les maisons et autres bâtiments publics:
"Construction des capteurs solaires incorporés dans le bâtiment"

Objectifs:
- Construire des chauffe-eau solaires à intégrer directement dans le bâtiment;
- Construire une maison type;
- Réduire de coût actuel des chauffe-eau solaire.

Coût: 40 000 $EU

Durée: 12 mois avec possibilité d'extension.

116. Projet No. 13

Titre du projet: Installation et exploitation de stations radiométriques au Rwanda

Objectifs:
- Collecte continue de données radiométriques et climatologiques liées au rayonnement;
- Traitement statistique de ces données en vue:
  . d'établir une carte radiométrique et climatique du pays;
  . de satisfaire la demande en documents d'études de base pour héliotechniciens, ingénieurs civils, agrométéorologues et autres usagers.
- Etablissement des modèles fiables de calcul des paramètres relatifs au rayonnement solaires en de sites non desservis par ce projet;
- Evaluation du degré de pollution atmosphérique;
- Diffusion des résultats des recherches (normes OMM).

Coût: 290 000 $EU

Durée: 24 mois avec possibilité d'extension.

117. Projet No. 14

Titre du projet: Evaluation du potentiel solaire et éolien de la sous-région de la CEPGL

Objectifs:
- Mettre à jour le potentiel solaire et éolien tant au niveau national que sous-régional
- Fournir un appui logistique quant à l'élaboration des programmes de développement de ce secteur.

Coût: 360 000 $EU

Durée: 12 mois

118. De ces 14 projets, le secrétariat de la CEA - MULPOC de Gisenyi a prié aux représentants du bailleur de fonds à la réunion d'examiner les possibilités de coopération pour la réalisation de certains projets que ces derniers retiendraient.

DTCD (1 project)

119. Project No. 1

1. Small hydropower feasibility and design studies in selected less and least developed countries in Africa (Burundi, Ghana, Lesotho, Sierra Leone, Somalia and Tanzania).

2. The development objective is to assist less and least developed African countries in the development and utilization of their small hydropower resources as part of their overall national energy development strategy in an effort to reduce dependence on imported energy resources.

3. The ministries of energy and relevant offices of Burundi, Ghana, Lesotho, Sierra Leone, Somalia and Tanzania).

4. 12 months.

5. US$ 2,100,000.

Sudan (1 project)

120. Project No. 1

1. Biogas for rural development

2. The objective of the project are to initiate the implementation of a programme, to develop, adopt and start popularizing the biogas technology in rural areas and to train a first group of officers in this new field of activities.

3. The Government of Sudan through the National Council for research and FAO.

4. 3 years.

5. 2,425,000 US$.

Ethiopia (6 projects)

121. Project No. 1

1. Solar energy utilization (integrated project)

2. To provide energy through solar photovoltaic systems

a) to a number of villages and peasants cooperatives for water pumping; illumination of public buildings, schools and clinics as well as refrigeration for medicines;

b) to a number of villages and peasants cooperatives for flour milling;

c) to irrigation schemes run by peasants cooperatives.

3. The Government of Ethiopia.

4. 3.5 years (a); 4,0 years (b); 4.0 years (c).

5. US$ 2,500,000 (a); 6,000,000 (b); 10,000,000 (c).

122. Project No. 2

1. Geothermal energy utilization (integrated project)

2. a) supply of a pilot backpressure turbine
- Generator Geothermal power plant

b) Binary system low enthalpy combined geothermal and solar power plant system

3. The Government of Ethiopia

4. 20 months (a); 3 years (b)

5. 7,000,000 US$(a); 1,500,000 (b).

123. Project No. 3

1. Development of mini-hydro plants

2. A number of mini hydro plants will be constructed to provide electricity both for subsistance and development needs, to rural areas;

3. The Government of Ethiopia

4. 5 years

5. 15,000,000 US$

124. Project No. 4

1. Installation of pilot ethanol plants

2. It is intended to introduce small scale ethanol production plants with the objective of minimizing the consumption of imported fuel oil. On this project pilot ethanol production plants will be installed and closely examined from the point of view of energy saving and possible large scale production of ethanol alcohol in Ethiopia.

3. The Government of Ethiopia

4. 12 months (Phase I)

5. 820,000 US$

125. Project No. 5

1. Pilot briquetting plants

2. It is envisaged to introduce agrobriquetting plants in areas of relatively high agri-waste potential. In this project pilot briquetting plants will be installed and the impact on the economy of this fuel as well as its adaptation problems will be studied.

3. The Government of Ethiopia.

4. 18 months

5. 450,000 US$.

126. Project No. 6

1. Pilot producer gas plants

2. It is intended to introduce producer gas technology in Ethiopia by installing pilot plants, these could be installed in plantation and state farms thus enabling the existing diesel powered generators to run on "dual fuel" mode.

3. The Government of Ethiopia

4. One year

5. 150,000 US$

ECA and the United Nations Statistical Office (one project)

127. Project No. 1

1. Providing technical and institutional support for the collection and compilation of statistics on new and renewable sources of energy in Africa.

2. The overall goal of the project is to develop the statistical capabilities at the national and regional level in order to provide planners with appropriate information on the resource potential, the actual supply, and the conversion and consumption modalities of NRSE in the region on a sustained basis.

   The specific objectives are:

   1. to increase the scope and detail of knowledge on currently observable NRSE supply and consumption in physical units and where possible also in monetary terms;

   2. to develop statistics on the resource potential of various forms of NRSE on a sub-regional and regional level within the ECA;

   3. to increase NRSE data into overall energy balances to be compiled by the countries involved in the programme;

   4. to develop the institutional infrastructure and the human resources in countries to carry out statistical programmes on NRSE on a comprehensive consistent and long-term basis.

3. ECA and the United Nations Statistical Office

4. 3 years and 9 months

5. 350,000 US$.

128. Zaire

1. Etude de faisabilité pour les aménagements des mini-centrales hydro-electriques et construction des ouvrages pilotes à l'Est du Zaire (Kivu) pour 2[illegible] millions de Zaires.

2. Rentrent dans le cadre du projet "Technologies appropries" pour 35 millions de Zaires.

   2.1 Etude de faisabilité pour la fabrication des équipements des centrales hydro-électrique de faible puissance et autres utilisant du biogaz;

2.2 Cooperation technique et transfert de technologie pour les équipements hydroélectrique de faible puissance et autres utilisant du biogaz

2.3 Formation dans le domaine des centrales hydroélectrique de faible puissance du biogaz;

2.4 Introduction des foyers améliorés transportable.

3. Rentrent dans le cadre du projet "valorisation des ressources d'énergie nouvelleset renouvelable" pour 10 millions de Zaïre.

3.1 Inventaire et evaluation du potentiel geothermique dans la sous-région de la CEPGL;

3.2 Inventaire du potentiel bio-énergétique dans la communauté économique des pays des grands lacs;

3.3 Biogaz et valorisation des déchets dans la sous-région de la CEPGL.

129. Following the presentation of projects, comments were made by donor countries and international organizations.

Italy

130. The representative of ENEA - a parastatal organization charged with development of nuclear and alternatives sources of energy in Italy thanked the organizers of the meeting for the invitation to ENEA to participate in the meeting. He said that the projects were all important. He informed the meeting that the Italian government has vast experience in the field of solar technologies, photovoltaics, biomass conversion, ranging from fermentation through pyrolysis to systems of gasification, hydropower and wind. Italy has African experience and currently the Ministry of Co-operation finances African projects in hydropower and photovoltaics. He also expressed the need to present the project with an integrated approach and link with enduses such as agriculture production, showing clearly what the objectives are, modalities of execution and what impact is expected. He asked if the projects have the blessings of government and if they really are considered priority projects.

Canada

131. The representative of the International Development and Research Centre (IDRC) indicated that IDRC has several programmes promoting the developing and utilization of NRSE. IDRC has sponsored programmes of afforestation including management of wood lots, co-operative programmes on peat, lignite and biogas, fellowships and training programmes, energy policy programmes, and programmes for rural development. He said IDRC would consider R & D projects which are clearly

conceived indicating inter-alia, the purpose of the project, potential application use of research results, modalities of implementation, institutional arrangements, etc. Projects would be submitted to the Board of Governors which would select the projects to be financed. It is noted worthy that 40 per cent of the energy funds have been allocated to Africa of the energy funds, 35 per cent have been allocated for woodfuel and 9 per cent for other biomass projects.

Brazil

132. The representative of Brazil said that he was happy to participate in the meeting because it was important for Brazil to maintain the co-operation it has developed with African countries. He said that Brazil has had some wide experience in the development and utilization of NRSE and can share this experience with African countries. Brazil will continue to provide technical assistance to Africa for the development and utilization of NRSE.

Sweden

133. The representative of SIDA said that Sweden has a lot of in the field of NRSE including technical development, demonstration plants on various techniques and planning. A phase of evaluation and information has been completed. However, Sweden has found problems in implementation and dissemination and has now decided to reassess the experience so far in order to find the best way to proceed in the future. A program will be decided upon in spring 1987.

FAO

134. The representative of FAO said that although FAO is not a financing organization, it is a tool that is used to provide technical assistance to countries. In this respect FAO catalyses activities in the field of NRSE particularly in biomass. The activities include development of biogas digesters and biogas networks in Asia and Latin America to be extended to Africa as well as training of experts through fellowships and seminar and study tours. The largest energy programme is reforestation with its associated industries of wood and timber, charcoal production and improved wood and charcoal-stoves. He further said that FAO had done an analysis of the projects submitted by countries and organizations and would leave the comments with ECA to be used in advising the countries in their further work on the projects. Finally he said that for contacts with FAO for any technical assistance requests, there is an FAO representative in each country with whom contacts can be made. There are also regional offices in each region apart from direct contact with the Headquarters in Rome.

UNEP

135. The representative of UNEP said that his organization is not a funding agency. Its role is to co-ordinate programmes and to catalyse activities in the field of new and renewable sources of energy, so that these lead to an improved environment.

ADB

136. ADB representative stated that the project profiles are not only numerous but covered various sectors namely Agriculture, Health, Education and Power. Consequently, these profiles need further examination by the Bank Group's experts in the respective sectors. He expressed that ECA could have prepared a note on a least one successful NRSE project in each sector e.g. fuelwood, minihydro, solar power and biomass. This would allow potential donors to make an assessment of NRSE projects in Africa. The project profiles are not complete and need further elaboration e.g. a request for a stuxy should contain detailed terms of reference, task of each expert, a brief description of the sector and other relevant data. Requests for projects should contain information on feasibility studies, executing Agency, project management and tariffs or pricing policy. The Bank Group is already financing NRSE project under the auspices of CIAO and would consider similar requests from other regional organizations.

UNDP.

137. The representative of UNDP said that greater clarity was required in the presentation of the projects so far considered including other indication of criteria for designating a project regional, subregional or national and linkages between the three levels pointed out. He stressed that projects in NRSE should be targeted towards solving the problems of the rural populations. He said that hitherto many countries have had development projects oriented towards the needs of the urban populations. With regard to assistance in the development of new and renewable sources of energy, UNDP has designated energy as one of the areas of concentration in the 4th UNDP programming cycle, 1987-1991. NRSE can also benefit from the programme. On certain specific projects on NRSE UNDP has indicated its sympathetic attitude to ECA on the understanding that the said projects will be substantially revised to clearly reflect the areas of need.

Arrangements for the implementation of NRSE projects (agenda item 6)

138. Most donor countries and international organizations presented the priorities on which they are concentrating their efforts and the general mechanisms by which projects are evaluated and considered for support. It was the view of most donors that this first presentation of the projects was useful but that they required most time, more information and most integral analysis in order to react more specifically on their interest to finance particular projects. It was agreed that for projects to be looked at and analysed easily, it was important

that they should be presented in a standardized format. A project should include the following: title or project, objectives of the project, background information, outputs/impact, inputs by recipient governments or institutions, inputs by donors or international organizations, personnel, equipment and other requirements, training programmes, activities and workplan, priority designation, duration of project and executing and co-operating organizations.

139. The UNEP representative offered to distribute a booklet UNEP has recently published on project design entitled "how to design a successful project". A suggestion was made that while agreeing with the standardize format, modifications are necessary depending on the nature of projects. For instance, the format for financing studies may be different from the format for financing the implementation of a project. It was pointed out that linkages between regional subregional and national projects should be encouraged although it may not always be possible to forge such links all the time. For example, in the case of projects proposed by CRES, intensive discussion between the Centre and national programmes preceeded the formulation of projects. The meeting agreed that development of NRSE should be done in isolation but integrated into other aspects of energy planning and indeed into overall socio-economic development planning.

140. Several delegations mentioned the problems of bureaucracy in the implementation of NRSE projects both on the donor and recipient sides. Suggestions were made on how to streamline the delivery of assistance to the institutions dealing with NRSE. One suggestion was the designation of focal points on both donor and recipient countries to expedite delivery of assistance to the target groups.

141. A representative of DIESA said that his department has a list of national focal points in different countries which could be distributed to participants in their countries.

Conclusions and recommendations (agenda item 8)

142. The Regional Consultative Meeting for Mobilization of Financial Resources for the Development of NRSE in Africa made the following conclusions:

1. This Consultative Meeting has resulted in a very useful exchange of information between the African countries, the donor countries, donor agencies and the international institutions represented. It can be ascertained that the meeting served the purpose of initiating a process of consultation which should lead to specific financial and technical assistance commitments.

2. Participants of the Consultative Meeting agree that renewable energy source continue to play an important role in meeting the energy requirements of African countries.

3. The surveys made indicated that there is a potential for solar energy for hydropower, for biomass utilization and wind energy.

4. In the rural areas energy consumption is characterized predominently by fuel wood and charcoal which is considered the major sources of energy. Improved stoves for better fueldwood charcoal utilization is of widespread interest.

5. Biomass utilization from agricultural and industrial wastage to be used in different manner, as direct combustion or gasification or pyrolysis, biogas or alcohol will contribute to the energy requirements.

6. Photovoltaic panels in remote rural areas may be regarded as very useful for pumping water and providing power for essential services, such as lighting, preserving vaccines through refrigeration and telecommunications.

7. Geothermal resources are valuable energy source in those area of Africa (especially in the eastern part of Africa) to be exploited and utilized and technologies are available as a potential solution to the energy problems.

8. Mini-hydropower could be regarded effective in remote areas to which it is impracticable to extend the national grid provided that the cost would be compatible with their uses.

9. Wind energy for water pumping (wind mills) and for small electric power production would partially contributed to the energy requirements in favourable locations.

143. The Regional Consultative meeting for the mobilization of financial resources for the development of NRSE in Africa made the following recommendations:

General

1. All NRSE projects should be geared towards rural development as far as possible and projects should be integrated into relevant governmental ongoing activities as much as possible.

2. While bilateral co-operation should be continued, multilateral arrangements should be encouraged and strengthened as a means of strengthening interafrican co-operation at subregional and regional levels.

3. It is recommended that the potential environmental impacts of all NRSE projects be assessed and evaluated, with the view to reducing these impacts to the practical minimum, in the most cost-effective ways. It is essential that the activities required for the assessment and management of these impacts be budgeted for in the project proposal itself.

Addressed to African member States

4. All the African Governments should consider the development of NRSE not in isolation but within over-all social and economic planning.

5. The participation of the private sector in the financing of the NRSE projects is not adequate though this participation is necessary and desirable. A mechanism for this should be analysed and strengthened.

6. Governments should lay emphasis on the assessment and development of manpower and skills required in the field of NRSE.

7. Governments should stress the analysis of employment, work safety and health and other economic implications of their socio-economic NRSE projects and policies.

Addressed to ECA and International Organizations

8. ECA is strongly urged to muster all its energies to help all african countries to secure funds for the development of NRSE, including training, R & D and demonstration programmes.

9. ECA and United Nations institutions should assist in the review of project proposals when requested by African governments and institutions within their technical and financial capabilities.

10. ECA should collect information regarding particular bilateral or multilateral negotiations of the project proposals, and in a year's time prepare a brief report on the activities resulting from this consultative meeting and make it available to the meeting's participants and other interested institutions or governments.

11. ECA should identify particular topics, issues or technological fields for which selective meetings could be convened to further advance in the mobilization of financial and technical assistance.

12. ECA should maintain close contact throughout the consultation process with other United Nations institutions in relation to the actual implementation of projects in order to effectively utilize their technical and executing potential. DIEC and DIESA are urged to assist ECA throughout the consultative process both in relation to co-ordination of United Nations institutions as in the contacts with donors.

13. ECA is strongly urged to follow-up and coordinate the implementation of the various recommendations regarding the development of NRSE in various UN, OAU and other meetings and to encourage the implementation of all regional and subregional projects in this field.

14. ECA is strongly urged to ensure that maximum priority should be given to training and education programmes in the field of NRSE in Africa and that it should be in a position to organize workshops or meetings on specific topics such as biomass, during the plans of project implementation and execution of national projects.

15. It has been noticed with concern that North African countries are not sufficiently involved in the ECA activities and one of the reasons for this could be the lack of missions mounted by ECA to this subregion. It is strongly recommended that North African member States should be visited by ECA staff dealing with NRSE issues.

16. ECA is strongly urged to approach some Arab and Islamic financial institutions as well as other institutions and seek their financial support for the implementation of the project proposals formulated by this meeting.

17. NRSE development in Africa requires greater inter-action and co-ordination between national, subregional and regional institutions. The meeting strongly recommends that ECA should create some mechanism which would ensure better use of the expertise and experiences gained already in some African countries.

18. The dissemination of information on NRSE technologies is crucial in the overall promotion of NRSE in African countries. The various organizations and agencies, particularly those within the UN systems are therefore urged to evolve a more effective system to enable better information dissemination of NRSE technologies.

Addressed to donor countries and organizations

19. All the donor Governments and agencies should be strongly urged to consider the financing of the development of NRSE within the energy development programmes of each country.

20. Given the fact that the majority of african population is confined to rural areas the projects on NRSE should be designed for the benefit of rural people. Donor countries are strongly urged to set aside the financial resources for the development of NRSE especially for the benefit of rural african communities.

21. Donor countries and agencies should more thoroughly review the project proposals submitted at the meeting and send their technical comments and their interest position to ECA and to the proposing institutions within the next three months.

22. The proposals submitted to the Regional Consultative Meeting should be reviewed in the light of technical comments received at the meeting in order to standardise their presentation format.

Adoption of the report of the meeting (agenda item 9)

144. The rapporteur presented draft report to the meeting and after discussion the report of the meeting was unanimously adopted incorporating the amendments and the Regional consultative meeting was declared closed by the Chairman.